CHAPTER 6

FUTURE DIRECTIONS IN THE NONCONNAH CREEK WATERSHED

6.1 BACKGROUND.

The Watershed Management Plan serves as a comprehensive inventory of resources and stressors in the watershed, a recommendation for control measures, and a guide for planning activities in the next five-year watershed cycle and beyond. Water quality improvement will be a result of implementing both regulatory and nonregulatory programs.

In addition to the NPDES program, some state and federal regulations, such as the TMDL and ARAP programs, address point and nonpoint issues. Construction and MS4 stormwater rules (implemented under the NPDES program) are transitioning from Phase 1 to Phase 2. More information on stormwatrer rules may be found at: http://www.state.tn.us/environment/wpc/stormh2o/MS4.htm.

This Chapter addresses point and nonpoint source approaches to water quality problems in the Nonconnah Creek Watershed.

6.2. COMMENTS FROM PUBLIC MEETINGS. Watershed meetings are open to the public, and most meetings were represented by citizens who live in the watershed, NPDES permitees, business people, farmers, and local river conservation interests. Locations for meetings were frequently chosen after consulting with people who live and work in the watershed. Everyone with an interest in clean water is encouraged to be a part of the public meeting process. The times and locations of watershed meetings are posted at: http://www.state.tn.us/environment/wpc/public.htm.

6.2.A. Year 1 Public Meeting. The first Nonconnah Creek Watershed public meeting was held October 1, 1996. The goals of the meeting were to 1)present, and review the objectives of, the Watershed Approach, 2)introduce local, state, and federal agency and nongovernment organization partners, 3)review water quality monitoring strategies, and 4)solicit input from the public.

Major Concerns/Comments

- Development and growth pressure
- Nonpoint source impacts on urban streams
- Floodplain encroachment
- Streambank erosion
- Contamination of groundwater from polluted surface water
- Wetland loss
- Too stringent controls on new development
- Cumulative effects of pollutants

6.2.B. Year 3 Public Meeting. The second Nonconnah Creek public meeting was held June 2, 1998 at Perimeter Park in Memphis. The goals of the meeting were to 1)provide an overview of the watershed approach, 2)review the monitoring strategy, 3)summarize the most recent water quality assessment, 4)discuss the TMDL schedule and citizens' role in commenting on draft TMDLs, and 5)discuss BMPs and other nonpoint source tools available through the Tennessee Department of Agriculture 319 Program and NRCS conservation assistance programs.

Major Concerns/Comments

- STP bypasses and overflows by Germantown and Collierville
- Difficult to find NPS solutions in an urban watershed
- Development and growth pressure
- Wetland loss

6.2.C. Year 5 Public Meeting. The third Nonconnah Creek Watershed public meeting was held August 20, 2002 at the Environmental Assistance Center (Memphis). The meeting featured eight educational stations:

- Draft Watershed Water Quality Management Plan
- Benthic macroinvertebrate samples and interpretation
- Smart Board with interactive GIS maps
- "Watershed Approach" (self-guided slide show)
- "How We Monitor Streams" (self-guided slide show)
- "Why We Do Biological Sampling" (self-guided slide show)
- Landowner Assistance Programs (NRCS and TDA)
- Stormwater Management Programs (City of Memphis)

In addition, citizens had the opportunity to make formal comments on the Draft Year 2002 303(d) List.

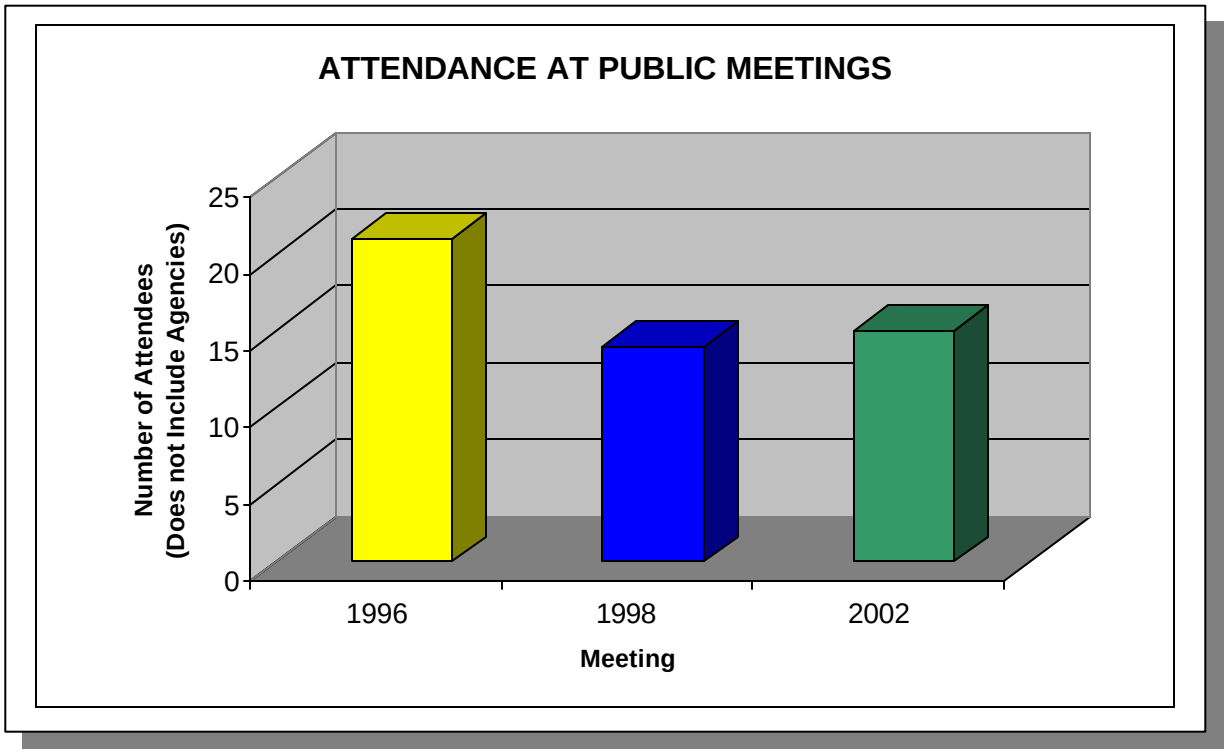

Figure 6-1. Attendance at Public Meetings in the Nonconnah Creek Watershed. *Attendance numbers do not include agency personnel.*

Figure 6-2. Participants at the Nonconnah Creek Watershed Meeting Interacted with Staff at Eight Educational Stations.

6.3. ASSESSMENT OF NEEDS.

6.3.A. Point Sources. Currently, the NPDES permitted point sources have not been found to be significant loading sources to an impacted stream in the Nonconnah Creek Watershed. The majority of these point sources are the result of noncontact coolong water discharges from industrial facilities. None of the major municipal sewage plants in the area have discharges in Nonconnah Creek or its tributaries.

Point source contributions to stream impairment are primarily addressed by NPDES and ARAP permit requirements and compliance with the terms of the permits. Notices of NPDES and ARAP draft permits available for public comment can be viewed at http://www.state.tn.us/environment/wpc/wpcppo/index.html. Discharge monitoring data submitted by NPDES-permitted facilities may be viewed at http://www.epa.gov/enviro/html/pcs/pcs_query_java.html.

The purpose of the TMDL program is to identify remaining sources of pollution and allocate pollution control needs in places where water quality goals are still not being achieved. TMDL studies are tools that allow for a better understanding of load reductions necessary for impaired streams to return to compliance with water quality standards. More information about Tennessee's TMDL program may be found at:
http://www.state.tn.us/environment/wpc/tmdl.htm

> **Nonconnah Creek TMDL- Approved December 18, 2001.** Total Maximum Daily Loads (TMDLs) for fecal coliform in Nonconnah Creek Watershed located in southwestern Tennessee:
> http://www.state.tn.us/environment/wpc/Noncon05.pdf

TMDLs are prioritized for development based on many factors.

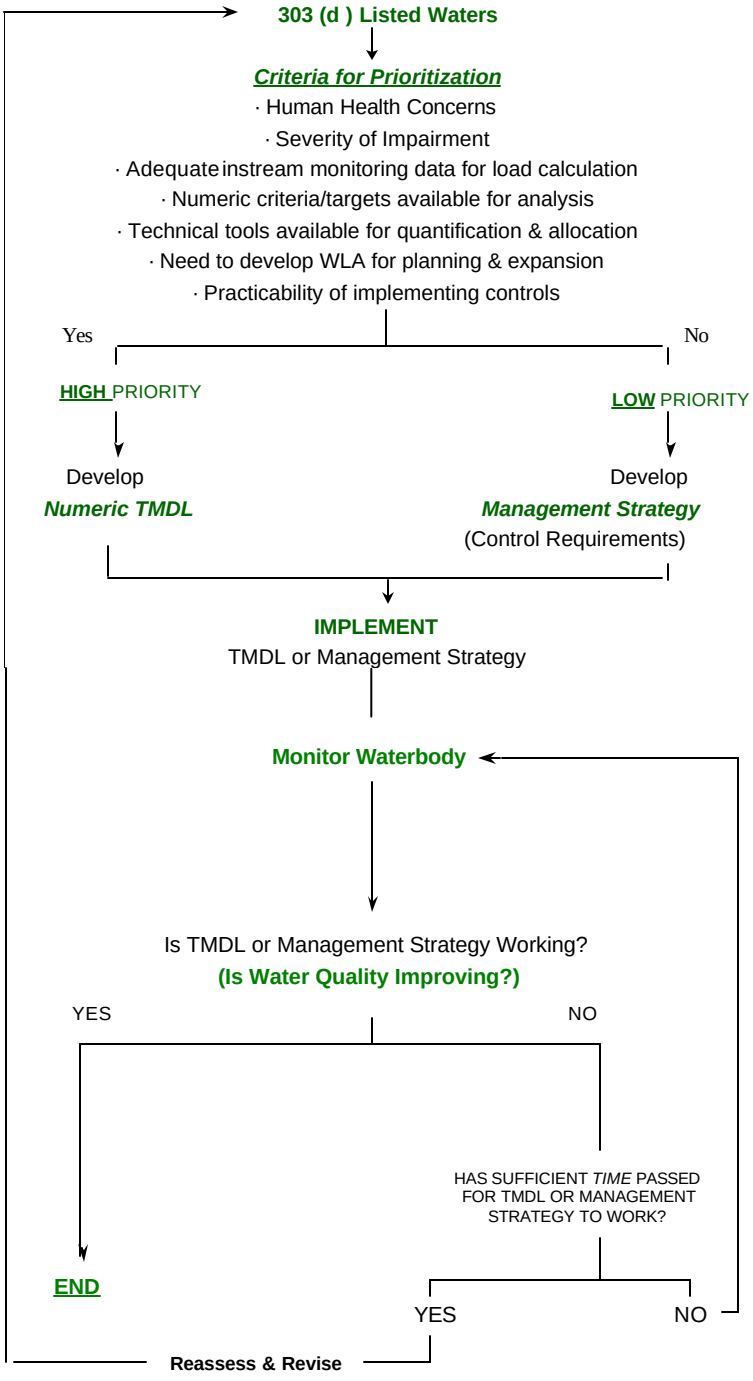

Figure 6.3. Prioritization scheme for TMDL Development.

6.3.B. Nonpoint Sources.

Common nonpoint sources of pollution include urban runoff, riparian vegetation removal, and inappropriate land development, agricultural, and road construction practices. Since nonpoint pollution exists essentially everywhere rain falls and drains to a stream, existing point source regulations can have only a limited effect, so other measures are necessary.

There are several state and federal regulations that can address some of the contaminants impacting Nonconnah Creek. Most of these are limited to only point sources: a pipe or ditch. Often, controls of point sources are not sufficient to protect waters, so other measures are necessary, like voluntary efforts by landowners and volunteer groups. Many agencies, including the Tennessee Department of Agriculture and NRCS, offer financial assistance to landowners for corrective actions (like Best Management Practices) that may be sufficient for recovery of impacted streams. Many nonpoint problems will require an active civic involvement at the local level geared towards establishment of improved zoning guidelines, building codes, streamside buffer zones and greenways, and general landowner education.

The following text describes certain types of impairments, causes, suggested improvement measures, and control strategies. The suggested measures and streams are only examples and efforts should not be limited to only those streams and measures mentioned.

6.3.B.i. Sedimentation.

6.3.B.i.a. From Construction Sites. Construction activities have historically been considered "nonpoint sources." In the late 1980's, EPA designated them as being subject to NPDES regulation if more than 5 acres are disturbed. The general permit issued for such construction sites sets out conditions for maintenance of the sites to minimize pollution from stormwater, including requirements for inspection of the erosion prevention and sedimentation controls in use at the site. The general permit also imposes more stringent inspection and self-monitoring requirements on sites in the watershed of streams that are impaired due to siltation.

Construction sites within a sediment-impaired watershed may also have higher priority for inspections by WPC personnel, and are likely to have enforcement actions for failure to control erosion. The downstream portion of Nonconnah Creek is severely impaired by siltation. Construction activities in the watershed may therefore be monitored more closely, subject to resource availability.

The same measures, which are currently required of all sites of 5 acres or more, can also be required on a site-by-site basis for smaller sites. New federal requirements will reduce the size of the sites subject to construction stormwater permitting to one acre, and local regulations may already address smaller sites. Regardless of the size, no construction site is allowed to cause a condition of pollution.

Due to population growth and development within the upper Nonconnah Creek Watershed during the last decade, sediment erosion and riparian destruction from

construction activities has become one of the main sources of stream impairment. The rapid pace of these activities have put a substantial strain on the ability of the state's limited resources to adequately inspect and monitor these sites. The establishment of local stormwater management agencies within larger urbanized areas in the next couple of years should aid in regulation and controlling runoff from construction activities. The City of Memphis currently has its own MS4 (Municipal Separate Storm Sewer System) program. Other municipalities within Shelby County are currently slated to develop their own MS4 programs as well. Part of the mandate for these MS4 programs will be to draft zoning and building codes designed to address sediment pollution.

Additional non-regulatory strategies for controlling sediment runoff for residents to consider include the immediate re-vegetation of any bare area, including ditches beside driveways, and the covering of topsoil piles.

6.3.B.i.b. From Channel and/or Bank Erosion. Due to past channelization of portions of Nonconnah Creek and many of its tributaries, the channels are unstable. Many channels in the watershed are incising at a rapid rate. Methods or controls that might be necessary to address these problems are:

Strategies

- Re-establishment of bank vegetation, primarily along the main stem of Nonconnah Creek.
- Better community planning of development impacts on small streams, especially development in rapidly growing areas (examples are Johns Creek, Tenmile Creek, and unnamed tributaries to Nonconnah Creek).
- Restrictions requiring post construction run-off rates to be no greater than pre-construction rates in order to avoid in-channel erosion, (for example, the main stem Nonconnah Creek).
- Prohibition on clearing of stream banks.
- Additional restriction to road and utilities crossings of streams.
- Restrictions on the use of off-highway vehicles on stream banks and in stream channels.

6.3.B.ii. Pathogen Contamination.

Possible sources of pathogens are inadequate or failing septic tank systems, overflows or breaks in public sewer collection systems, and fecal matter in streams and storm drains due to pets, livestock and wildlife. Permits issued by the Division of Water Pollution Control regulate discharges from point sources. These permits require adequate control of these sources, and require subsurface, on-site treatment (i.e., septic tank and field lines) if public sewers are not available. Septic tank and field lines in the Nonconnah Creek watershed are regulated by the Memphis Shelby County Health Department. In addition to discharges to surface waters, businesses may employ either subsurface or surface disposal of wastewater. The Division of Water Pollution Control regulates surface disposal.

Other measures that may be necessary to control pathogens are:

- Greater enforcement of regulations governing on-site wastewater treatment.

- Timely and appropriate enforcement for non-complying sewage treatment plants, large and small, and their collection systems.
- Greater efforts by sewer utilities to identify leaking lines or overflowing manholes particularly along the main stem of Nonconnah Creek.
- Restrict development in areas where sewer is not available to those sites with appropriate soils.
- Discourage the creation of "duck holes" that attract waterfowl.
- Develop and enforce leash laws and controls on pet fecal material.

6.3.B.iii. Excessive Nutrients and/or Dissolved Oxygen Depletion.

These two impacts are usually listed together because high nutrients often contribute to low dissolved oxygen within a stream. Since nutrients often have the same source as pathogens, the measures previously listed can also address many of these problems. Elevated nutrient loadings are also often associated with urban runoff from impervious surfaces and from fertilized lawns and croplands.

Other sources of nutrients can be addressed by:

Voluntary activities

- Educate homeowners and lawn care companies in the proper application of fertilizers.
- Encourage landowners, developers, and builders to leave stream buffer zones. Streamside vegetation can filter out many nutrients and other pollutants before they reach the stream. These riparian buffers are also vital along livestock pastures.
- Use grassed drainageways that can remove fertilizer before it enters streams.
- Use native plants for landscaping since they don't require as much fertilizer and water.

Physical changes to streams can prevent them from providing enough oxygen to biodegrade the materials that are naturally present. A few additional actions can address this problem:

- Maintain shade over a stream. Cooler water can hold more oxygen and retard the growth of algae. Johns Creek, Tenmile Creek, Cane Creek, Hurricane Creek, and the main stem of Nonconnah Creek suffer from canopy removal.
- Discourage impoundments. Ponds and lakes do not aerate water. *Note: Permits are required for any work on a stream, including impoundments.*

6.3.B.iv. Toxins and Other Materials.

Many materials enter our streams due to apathy, or lack of civility or knowledge by the public. Litter in roadside ditches, garbage bags tossed over bridge railings, paint brushes washed off over storm drains, and oil drained into ditches are all examples of pollution in streams. Some can be addressed by:

Voluntary activities

- Providing public education.
- Painting warnings on storm drains that connect to a stream.
- Sponsoring community clean-up days.
- Landscaping of public areas.
- Encouraging public surveillance of their streams and reporting of dumping activities to their local authorities.

Needing regulation

- Prohibition of illicit discharges to storm drains (local MS4 programs will help address this).
- Litter laws and stronger enforcement at the local level.

6.3.B.v. Habitat Alteration.

The alteration of the habitat within a stream can have severe consequences. Whether it is the removal of the vegetation providing a root system network for holding soil particles together, the release of sediment, which increases the bed load and covers benthic life and fish eggs, the removal of gravel bars, "cleaning out" creeks with heavy equipment, or the impounding of the water in ponds and lakes, many alterations impair the use of the stream for designated uses. Habitat alteration also includes the draining or filling of wetlands.

Most of the tributaries in the lower reaches of Nonconnah Creek within Memphis city limits have been concrete lined. This contributes to erosion problems in the downstream sections of the natural portions of the channels due to increased velocities in the concrete portion. Examples of streams affected by habitat alteration are Black Bayou, Days Creek, Johns Creek, and Tenmile Creek. A large portion of Hurricane Creek flows through Memphis International Airport and has been severely impacted by habitat alteration. Much of the channel is lined with concrete, and some areas have concrete structures to control the flow and create pools.

Measures that can help address this problem are:

Voluntary activities

- Sponsoring litter pickup days to remove litter that might enter streams.
- Organizing stream cleanups removing trash, limbs and debris before they cause blockage.
- Avoiding use of heavy equipment to "clean out" streams.
- Planting vegetation along streams to stabilize banks and provide habitat.
- Encouraging developers to avoid extensive culverts in streams and the relocation of stream channels. *Permits are required for these activities in stream channels.*

Current regulations

- Restrict modification of streams by such means as culverting, lining, relocating, or impounding.
- Require mitigation for impacts to streams and wetlands when modifications are allowed.

Additional Enforcement

- Increased enforcement may be needed when violations of current regulations occur.